CLAIMS

What is claimed is:

1. A printing device comprising:

multiple ejection chambers positioned in a print head, individual ejection chambers comprising an electrical component, the print head defining a fluid-feed path configured to supply fluid to the ejection chambers for ejection from the print head;

a filter extending generally across the fluid-feed path so that fluid passes through the filter before reaching the multiple ejection chambers; and,

a controller configured to cause energizing of individual electrical components in a bubble moving pattern designed to move a bubble located between the ejection chambers and the filter to a region where the bubble can pass through the filter, wherein said energizing does not cause fluid to be ejected from the print head.

2. The printing device of claim 1, wherein the electrical component comprises a resistor.

3. The printing device of claim 1, wherein the filter comprises a generally planar surface that extends generally transverse the fluid-feed path.

4. The printing device of claim 1, wherein the filter comprises a portion of

a manifold which supplies fluid received from a fluid feed slot to individual ejection chambers.

5. The printing device of claim 1, wherein the filter comprises a photo-imagable polymer layer having apertures patterned therein.

6. The printing device of claim 1, wherein the filter comprises a layer having apertures patterned therein.

7. The printing device of claim 6, wherein the apertures are generally uniform in size.

8. The printing device of claim 6, wherein the layer is positioned between a silicon substrate through which the fluid-feed path passes and the multiple ejection chambers.

9. The printing device of claim 6, wherein individual ejection chambers comprise a nozzle and wherein a nozzle bore dimension taken transverse to the fluid-feed path is greater than a dimension of an individual aperture taken transverse the fluid-feed path.

10. The printing device of claim 6, wherein the apertures are generally uniform in shape.

11. The printing device of claim 6, wherein the apertures comprise multiple apertures of a first size and at least one second larger size aperture.

12. The printing device of claim 11, wherein the at least one second larger size aperture is generally diamond shaped when viewed transverse to the fluid-feed path.

13. The printing device of claim 11, wherein individual apertures comprising the multiple apertures of the first size are generally circular when viewed transverse to the fluid-feed path.

14. The printing device of claim 11, wherein the at least one second larger size aperture is centrally located on the layer.

15. The printing device of claim 1, wherein the multiple ejection chambers are arranged in a generally linear array, and wherein the controller is configured to energize the resistors in a pattern comprising a sequential pattern involving resistors of at least two adjacent ejection chambers.

16. The printing device of claim 1, wherein the resistors are arranged in pairs with the resistors comprising each pair located on opposing sides of a fluid-feed channel, and wherein the controller is configured to sequentially energize pairs of resistors to move the bubble.

17. A fluid ejecting system comprising:

a fluid-feed channel configured to supply fluid to a plurality of ejection chambers, individual ejection chambers comprising a resistor configured to eject fluid from the individual ejection chamber; and,

a processor configured to cause an individual resistor to be energized at a first intensity sufficient to eject fluid from a respective ejection chamber, the processor further configured to cause the resistor to be energized at a second lower intensity which heats the resistor but does not cause fluid to be ejected from the respective ejection chamber, and wherein the processor can energize, at the second lower intensity level, individual resistors in a pattern designed to detach a bubble from a surface defining a portion of the fluid-feed channel.

18. The system of claim 17, wherein the fluid-feed channel is defined in a printing device, and wherein the processor comprises a portion of the printing device.

19. The system of claim 17, wherein the fluid-feed channel is defined in a printing device, and wherein the processor comprises a portion of a computing device coupled to the printing device.

20. The system of claim 17, wherein the processor is configured to detach and to move the bubble.

21. The system of claim 20, wherein the processor is configured to move

the bubbles in a direction generally opposite to a direction of fluid flow in the fluid-feed channel.

22. The system of claim 20, wherein the processor is configured to move the bubbles toward a structure configured to evacuate bubbles from the fluid-feed channel.

23. The system of claim 20 further comprising a filter positioned to prevent contaminants in the fluid from entering the ejection chambers, and wherein the processor is configured to detach and to move a bubble located between the filter and the ejection chambers.

24. A printing device comprising:

a print head comprising multiple electrical components;

multiple ejection chambers formed in the print head, at least some of the individual ejection chambers comprising an associated one of the multiple electrical components configured to be energized sufficiently to cause fluid to be ejected from the ejection chamber, the print head defining a fluid-feed channel configured to supply fluid to the ejection chambers for ejection from the print head; and,

a controller configured to cause energizing and resultant heating of at least some of the multiple electrical components in a bubble moving pattern designed to move a bubble in a desired direction within the fluid-feed channel, wherein said energizing does not cause fluid to be ejected from the print head.

25. The printing device of claim 24, wherein the controller is further configured to sufficiently energize at least one of the electrical components to cause at least a portion of the fluid to be ejected from the ejection chamber.

26. The printing device of claim 24, wherein the associated individual electrical component comprises a resistor.

27. The printing device of claim 24, wherein the associated individual electrical component comprises a piezoelectric crystal.

28. The printing device of claim 24, wherein at least some of the multiple electrical components comprise transistors.

29. A method comprising:

positioning a filter relative to a fluid supply path of a micro electro mechanical systems device so that fluid passes through the filter before reaching one or more ejection chambers of the micro electro mechanical systems device; and,

configuring a processor to energize one or more electrical components at an intensity primarily selected to heat but not to vaporize the fluid, wherein the processor is configured to energize the electrical components in a pattern designed primarily to move a pre-existing bubble located between the electrical components and the filter to a location where the bubble can pass

through the filter.

30. The method of claim 29, wherein said act of configuring moves the bubble in a direction generally opposite to the flow of the fluid through the filter.

31. The method of claim 29, wherein said act of positioning a filter comprises forming a patternable material over a substrate prior to forming a portion of the fluid-feed path through the substrate, and further comprising patterning apertures in the patternable material.

32. The method of claim 29 further comprising the processor being configured to energize at least some of the electrical components at a second higher intensity primarily to vaporize at least a portion of the fluid.

33. One or more computer-readable media having computer-readable instructions thereon which, when executed, cause a micro electro mechanical systems device to:

energize a first electrical component at an intensity selected primarily to heat but not to vaporize fluid contained in the micro electro mechanical systems device; and,

energize at least one different electrical component at an intensity selected primarily to heat but not to vaporize fluid contained in the micro electro mechanical systems device, wherein the processor is configured to

energize the first electrical component and the at least one different electrical component in a pattern designed to move a bubble in a desired direction within the micro electro mechanical systems device.

34. One or more computer-readable media having computer-readable instructions thereon which, when executed by a micro electro mechanical systems device, cause the micro electro mechanical systems device to:

energize a first set of electrical components to eject fluid from the micro electro mechanical systems device; and,

energize a second set of electrical components at an intensity selected primarily to heat but not to vaporize fluid contained in the micro electro mechanical systems device, wherein the processor is configured to energize the second set of electrical components in a pattern designed to move a bubble in a desired direction within the micro electro mechanical systems device.

35. A device comprising:

means for selectively ejecting fluid from a fluid-delivery device; and,

means for heating fluid contained in the fluid-delivery device in a contaminant moving pattern designed to move a contaminant contained in the fluid-ejecting device without ejecting fluid from the fluid-delivery device.

36. The device of claim 35, wherein the means for ejecting also comprises the means for heating.

37. The device of claim 35, wherein the means for ejecting comprises a subset of the means for heating.

38. The device of claim 35, wherein the means for ejecting is different from the means for heating.

39. The device of claim 35 further comprising a means for filtering the fluid as the fluid travels along a fluid-supply path with the fluid-delivery device.

40. The device of claim 38 wherein the contaminant moving pattern moves the contaminant generally opposite to fluid flow along the fluid-supply path.